DRAFT
June 1, 1998

Multi-Objective Approaches To Floodplain Management On A Watershed Basis: Preliminary Benefit/Cost Analysis Framework Flowcharts

Attached is a preliminary set of flowcharts which illustrate the proposed benefit/cost analysis framework for this study. It is anticipated that these flowcharts may change (perhaps significantly) over the next couple of months as we focus upon the proposed B/C analysis framework. However, these flowcharts should provide a useful starting point for our work, especially with the U.C. Water Resources Advisory Committee. These flowcharts include:

- Figure 1 illustrates the overall floodplain management planning process and the relationship of the B/C analysis framework to that process;
- Figure 2 gives a "broad brush" look at the B/C analysis framework;
- Figure 3 expands Figure 2 by showing the floodplain functions to be evaluated in the B/C analysis (these functions need to be discussed further by the work group);
- Figures 4 - 11 illustrate how to compute values for the floodplain functions: flood/erosion control, M&I and agricultural water supply/quality, fish and wildlife habitat, recreation, energy, agriculture/forestry/fisheries, cultural/social and navigation/transportation. These flowcharts are from the Federal Principles and Guidelines (1983). Although I think some (if not all) of these flowcharts can be improved, at least they provide a "starting point". Figure 7B is somewhat different from the others in that it suggests a procedure to choose the most appropriate model for evaluating federal recreation benefits, an approach we may want to modify and adopt since we're looking at different valuation techniques;
- Figures 6 (Fish/Wildlife Habitat Values), 9B (Forest Production Values), 10 (Cultural/Social Values) and 12 (Plan Implementation Political Process) still need to be developed;
- Figure 13 is an example B/C analysis framework adopted from work of the United Nations Food and Agricultural Organization. A strength of this flowchart is that it better illustrates the physical/socioeconomic relationships; however, it tends to be somewhat more difficult to follow and implement. I think the floodplain function approach shown in Figure 3 is more understandable and it also directly correlates with work currently being done by others. Some of the relationship detail shown in Figure 13 can probably be worked into Figures 4 - 11.

The next step for the work group is to refine all of these flowcharts, particularly Figures 4 - 11, with the help of the U.C. Water Resources Center Advisory Committee.

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Figure 1: Floodplain Management Planning Process

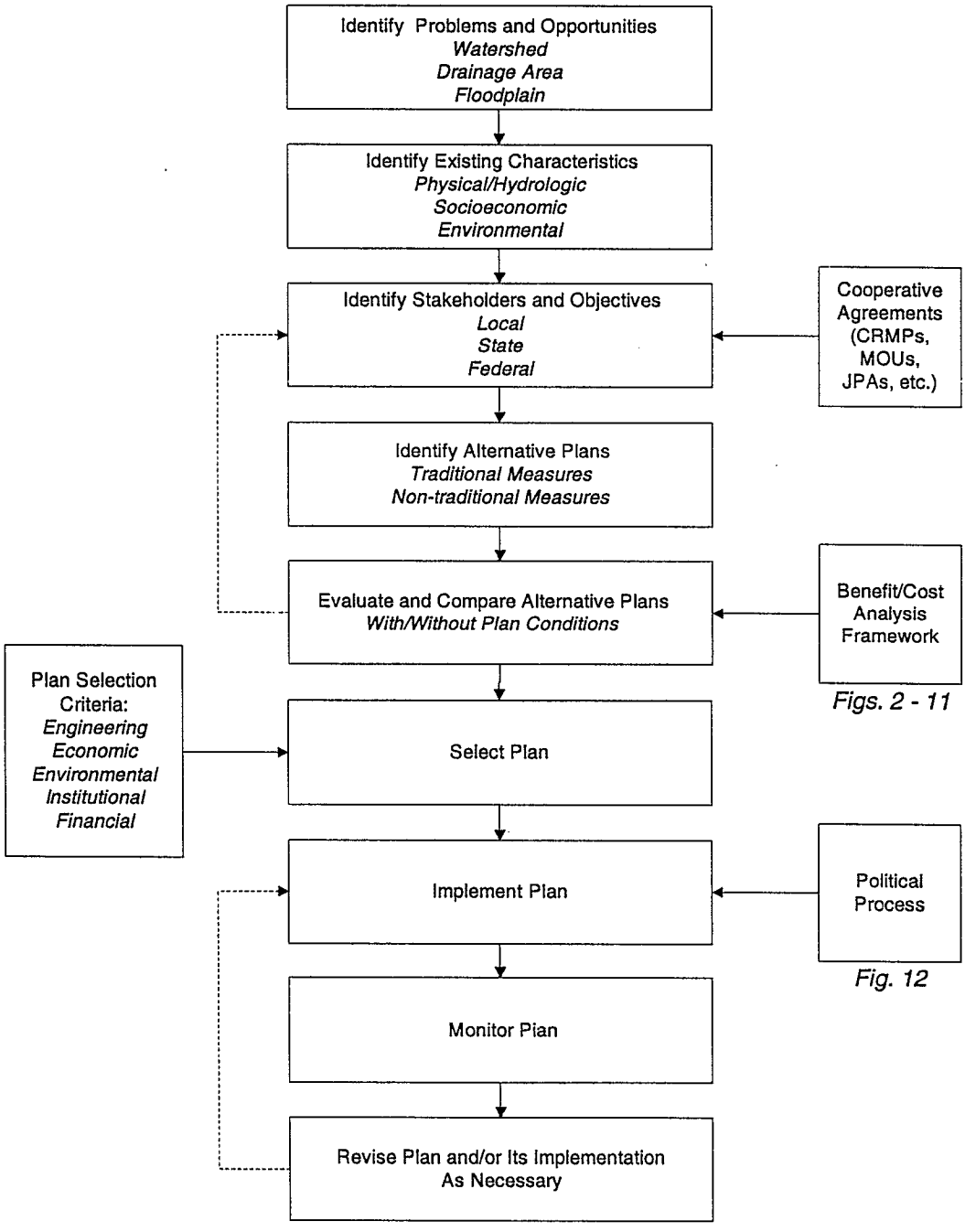


Figure 2: Benefit/Cost Analysis Framework

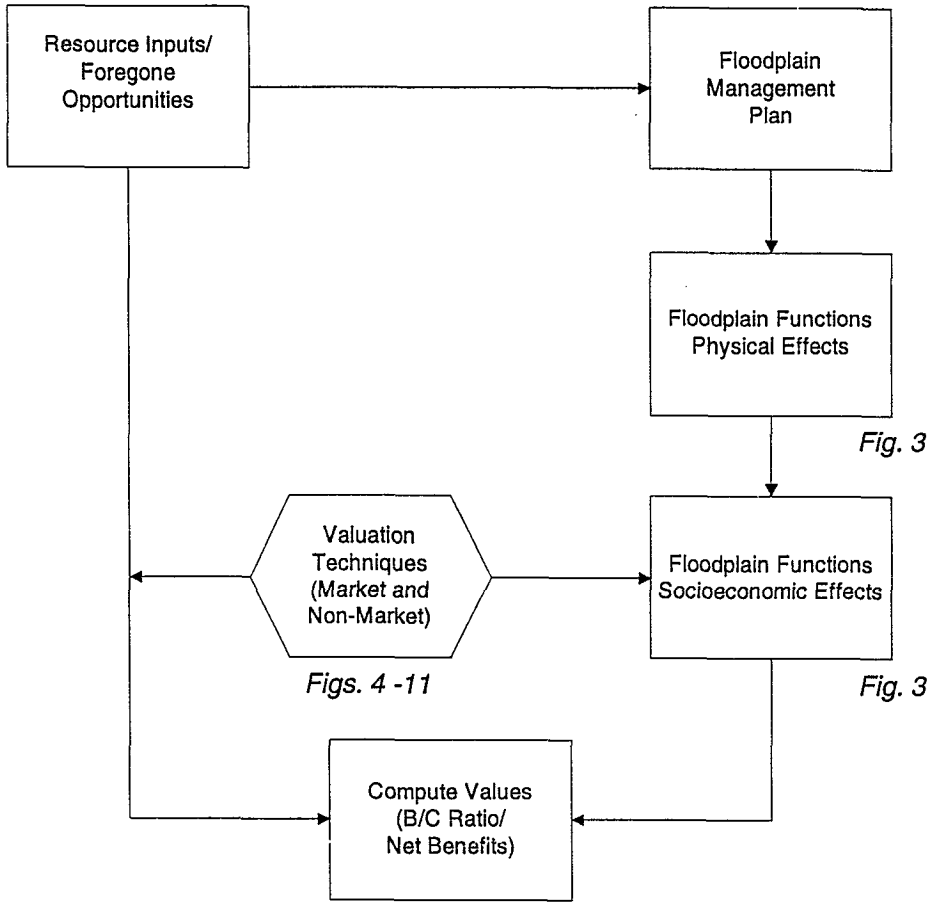


Figure 3: Benefit/Cost Analysis Framework: Floodplain Functions

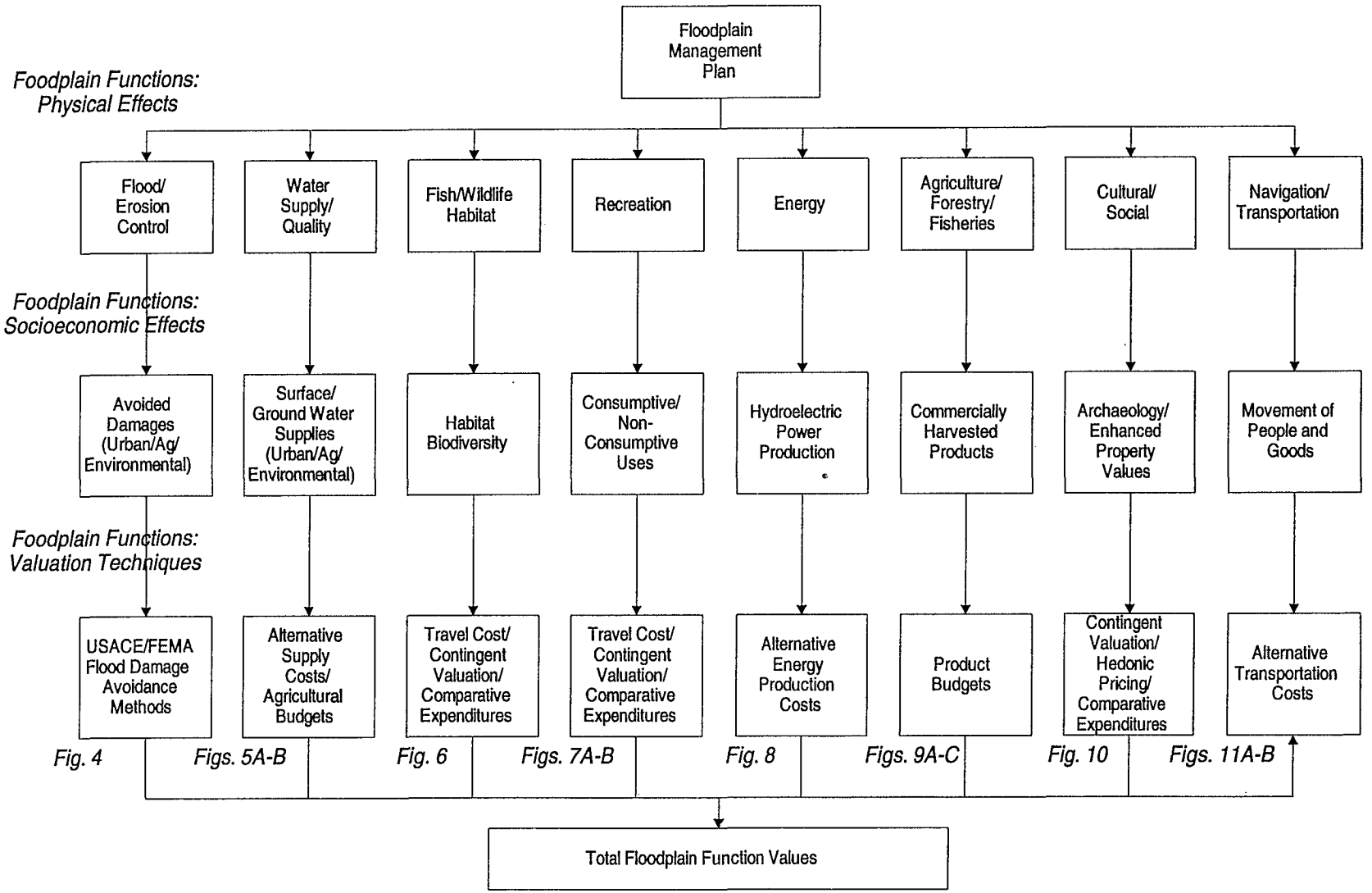
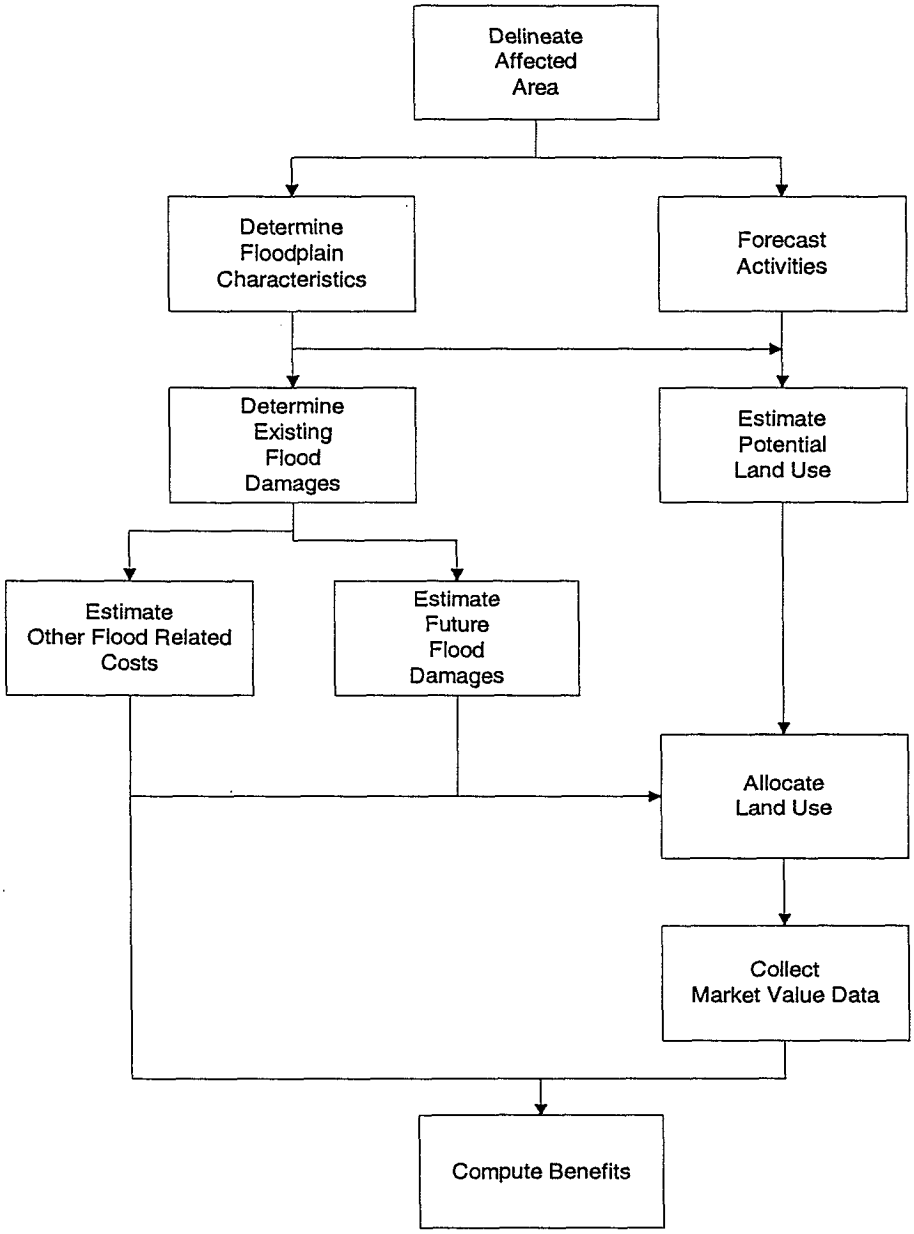


Figure 4: Benefit/Cost Analysis Framework: Flood/Erosion Control Values



Source: Principles and Guidelines (3/83)

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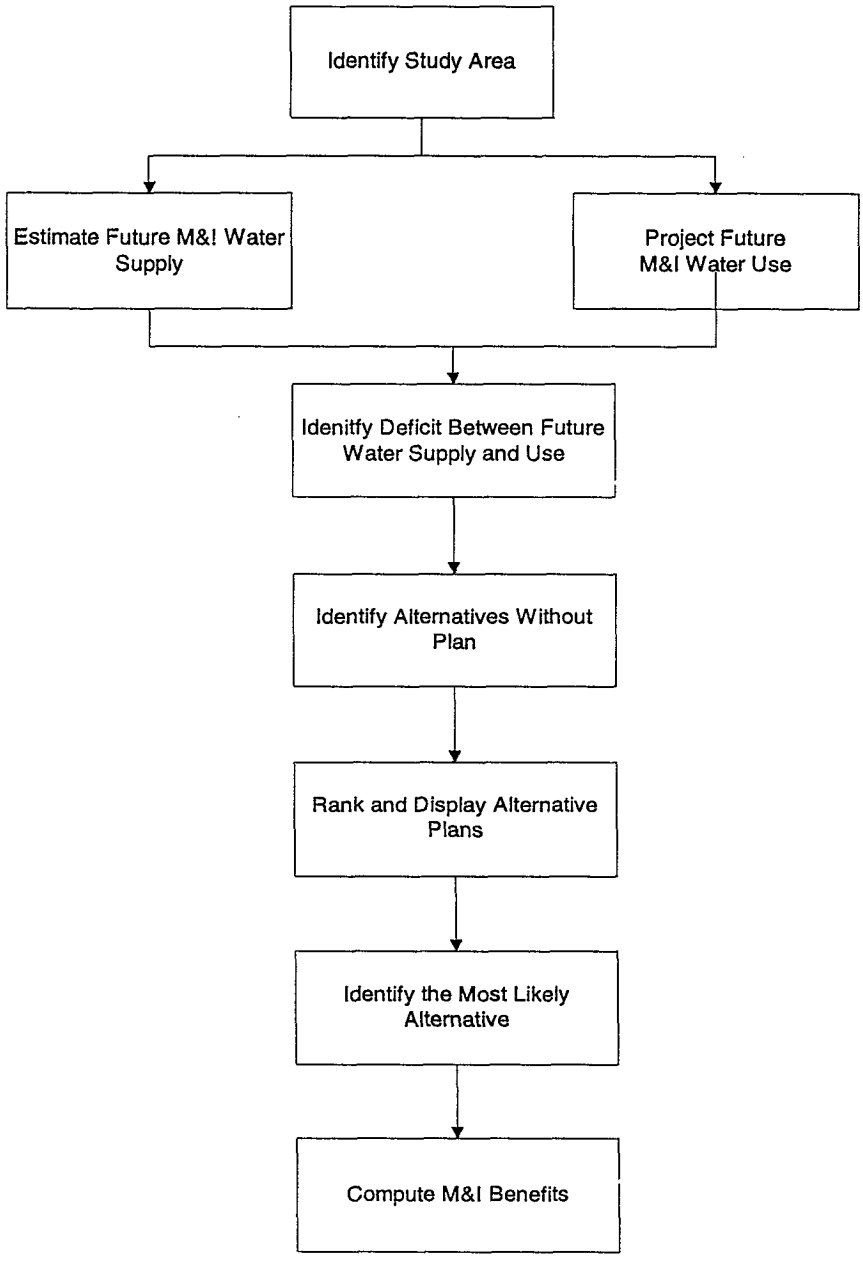
Figure 5A: Benefit/Cost Analysis Framework: Water Supply/Quality Values

Municipal and Industrial



Source: Principles and Guidelines (3/83)

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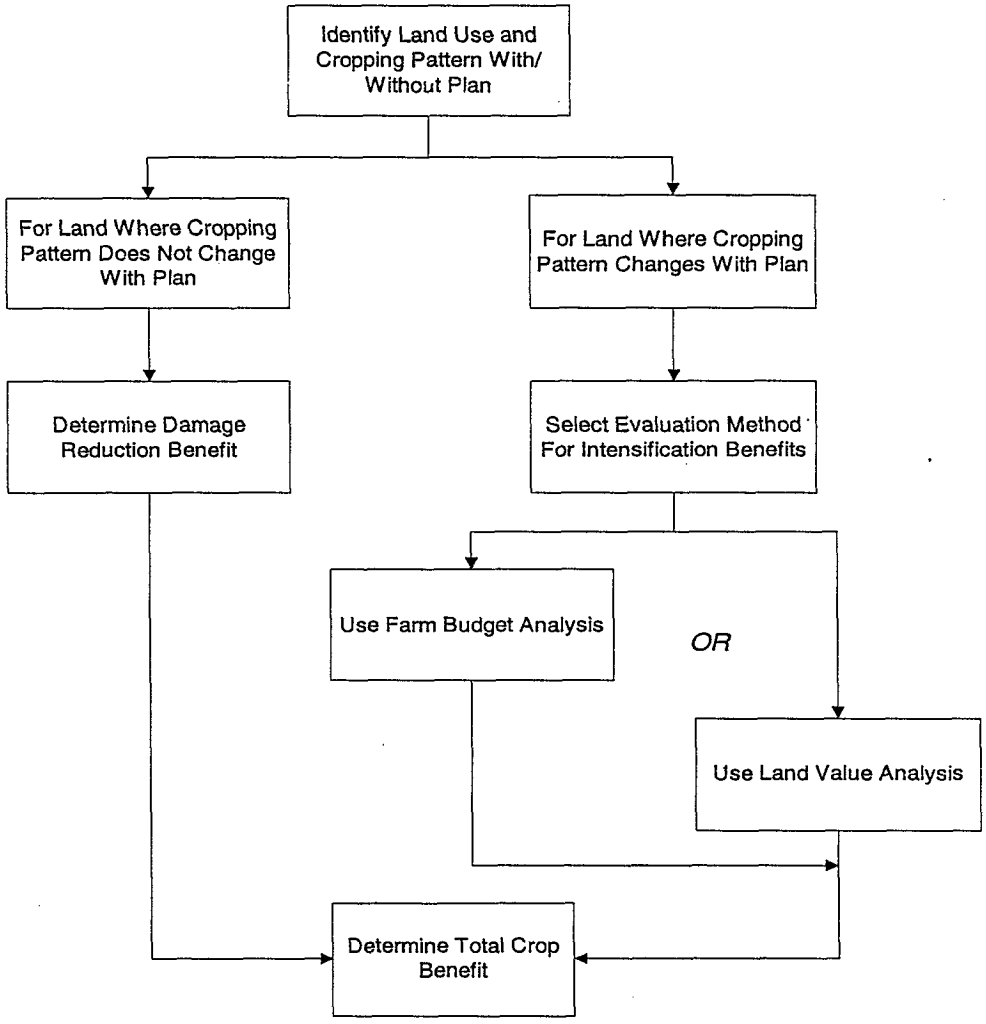
Figure 5B: Benefit/Cost Analysis Framework: Water Supply/Quality Values

Agricultural



Source: Principles and Guidelines (3/83)

Figure 6: Benefit/Cost Analysis Framework: Fish/Wildlife Habitat Values

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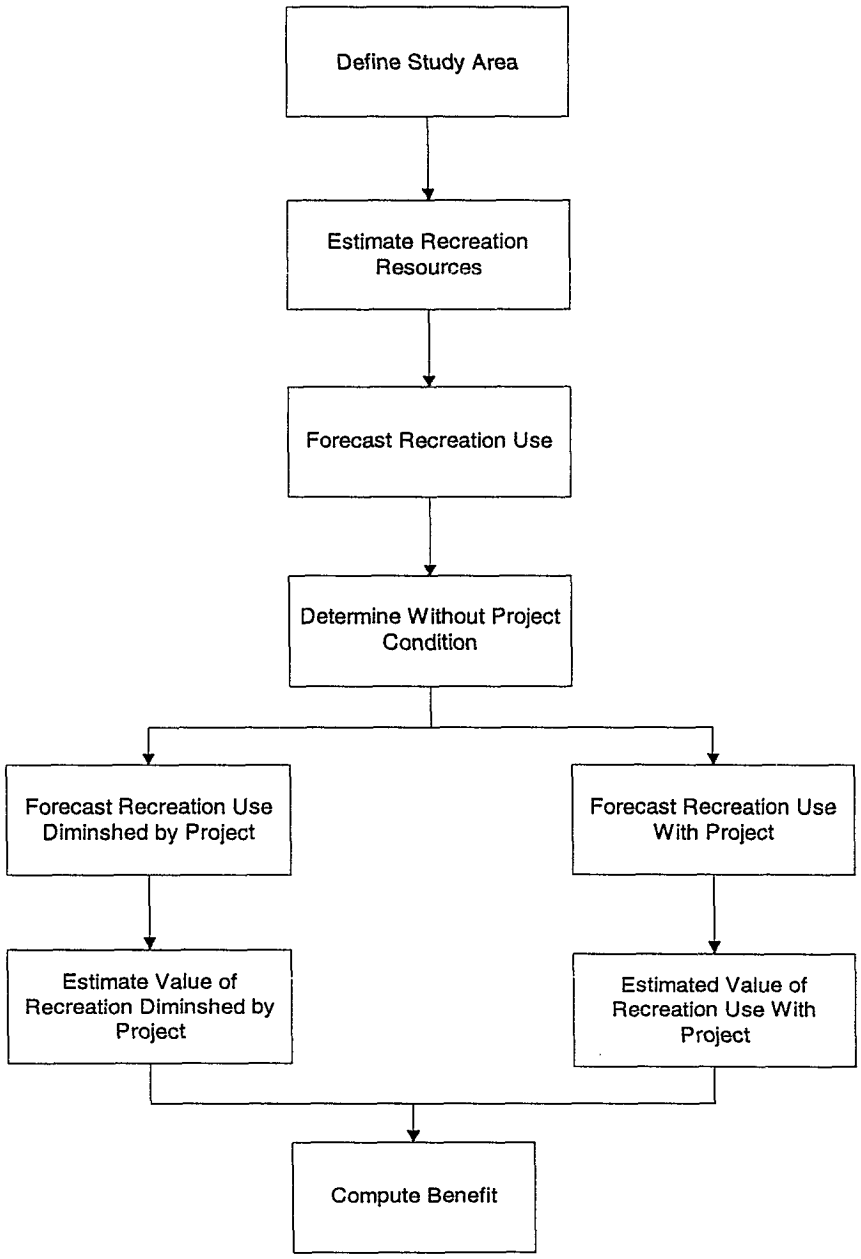
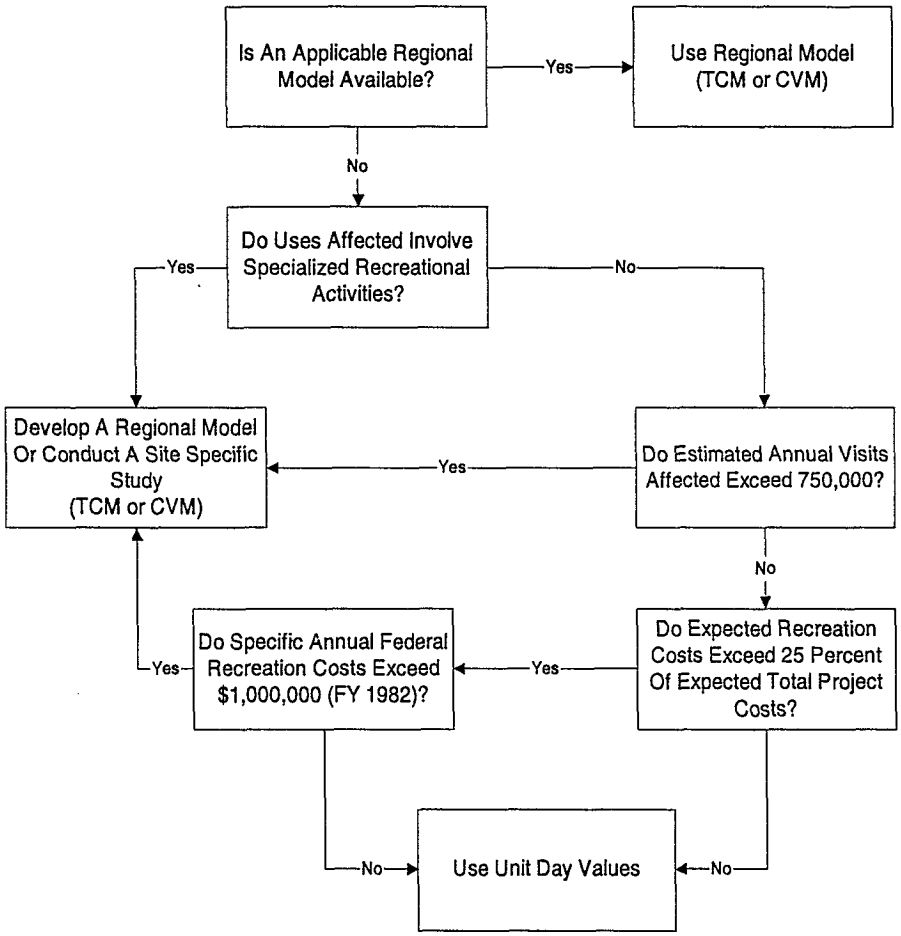
Figure 7A: Benefit/Cost Analysis Framework: Recreation Values



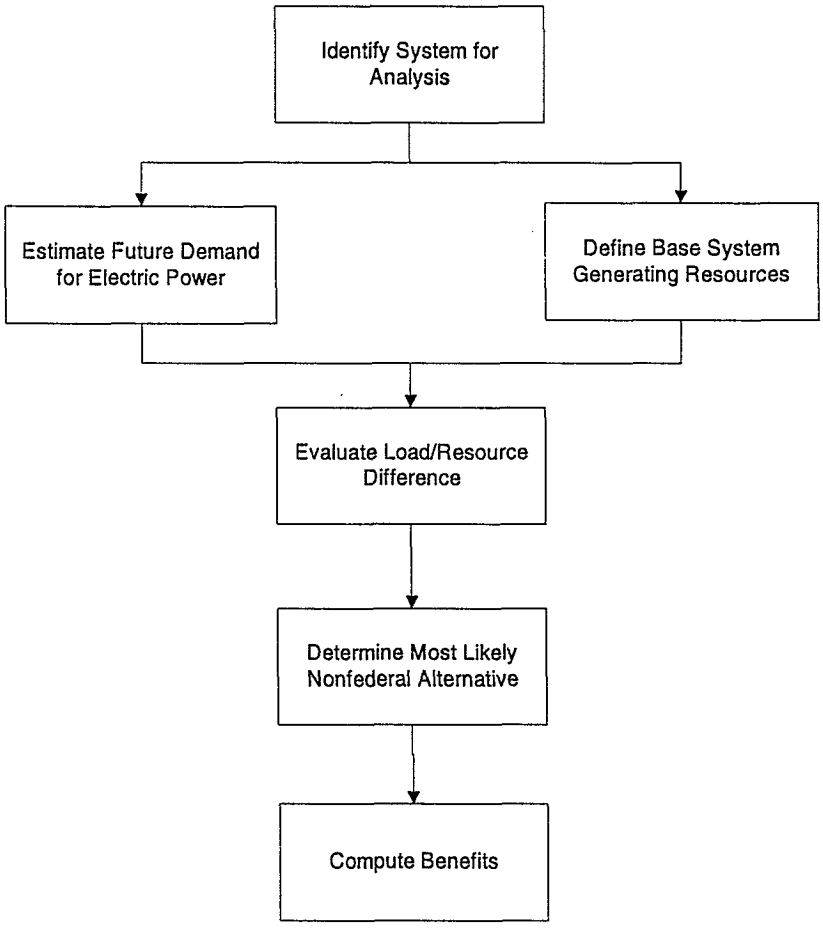
Source: Principles and Guidelines (3/83)

Figure 7B: Benefit/Cost Analysis Framework: Federal Recreation Valuation Criiteria



Source: Principles and Guidelines (3/83)

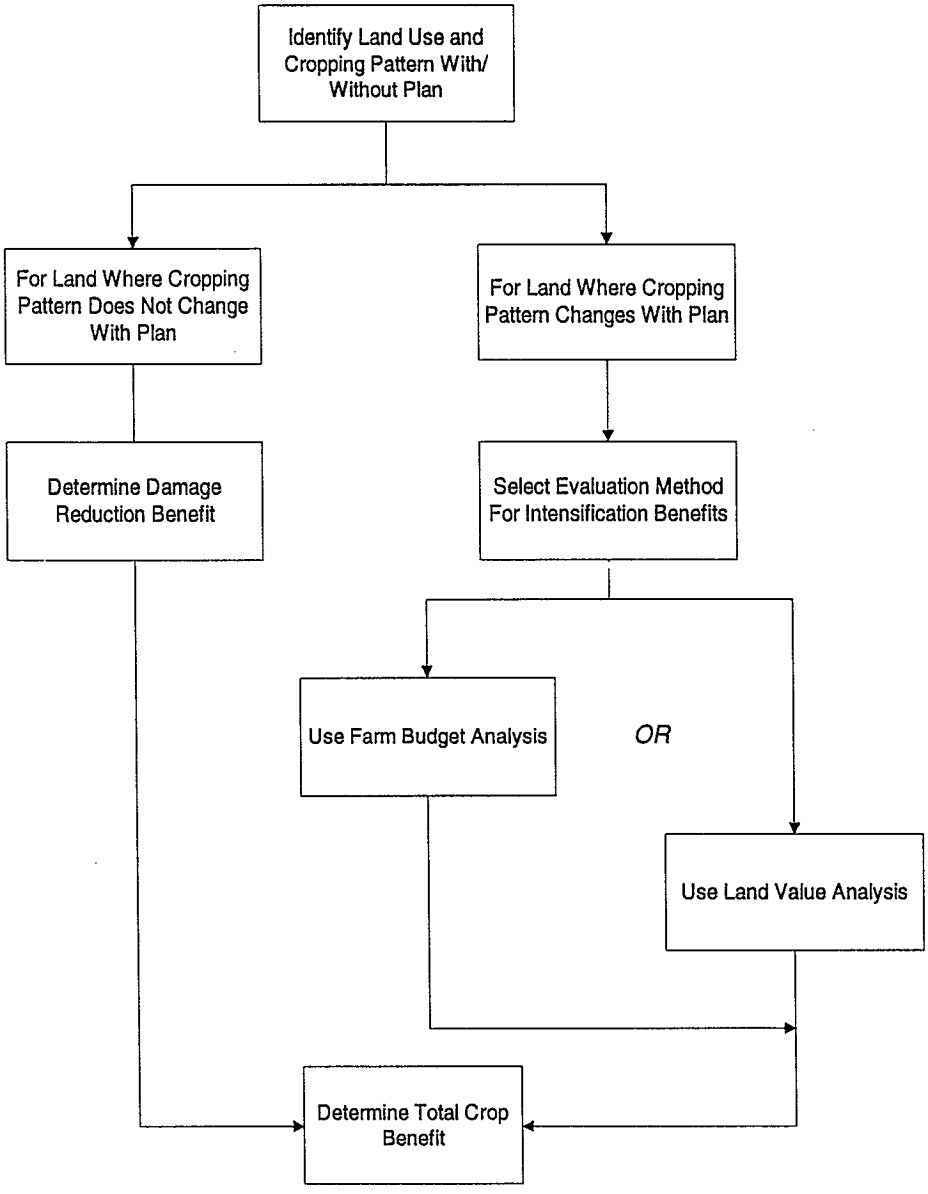
Figure 8: Benefit/Cost Analysis Framework: Energy Values



Source: Principles and Guidelines (3/83)

Figure 9A: Benefit/Cost Analysis Framework: Agricultural/Forest/Fisheries Production Values

Agricultural



Source: Principles and Guidelines (3/83)

Figure 9B: Benefit/Cost Analysis Framework: Agricultural/Forest/Fisheries Production Values

Forestry

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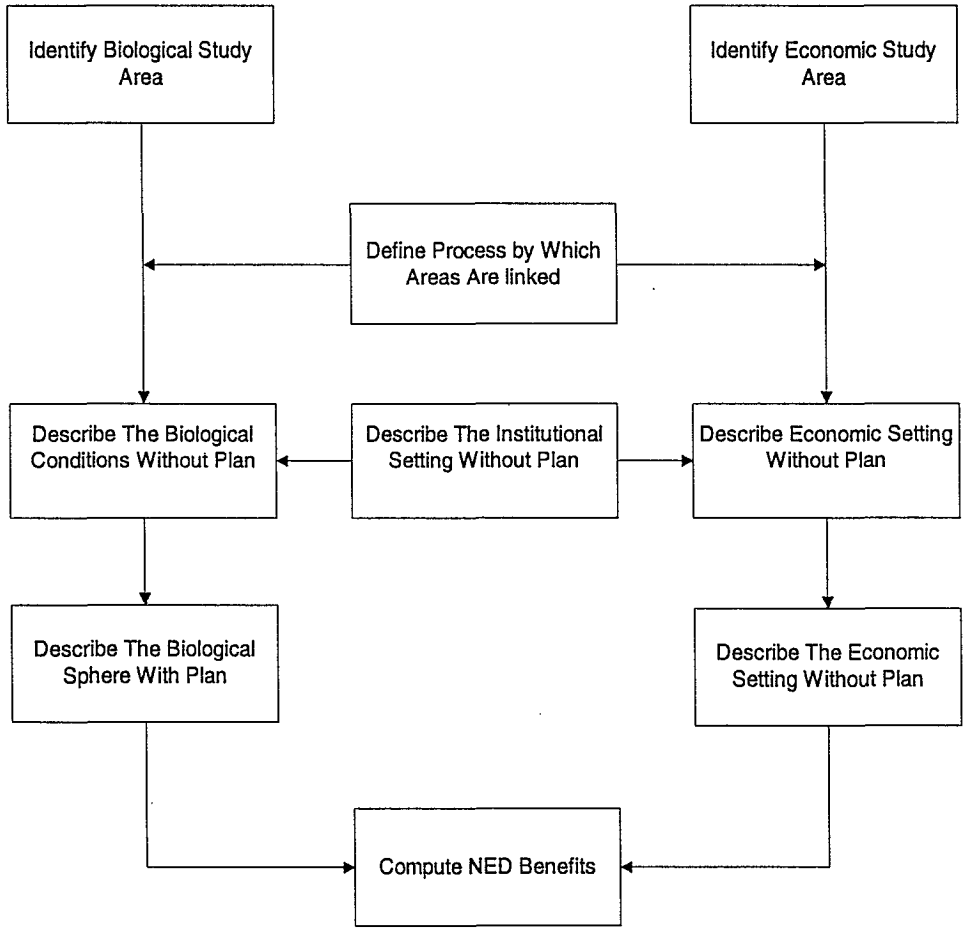
Figure 9C: Benefit/Cost Analysis Framework: Agricultural/Forest/Fisheries Production Values

Commercial Fishing



Source: Principles and Guidelines (3/83)

Figure 10: Benefit/Cost Analysis Framework: Cultural/Social Values

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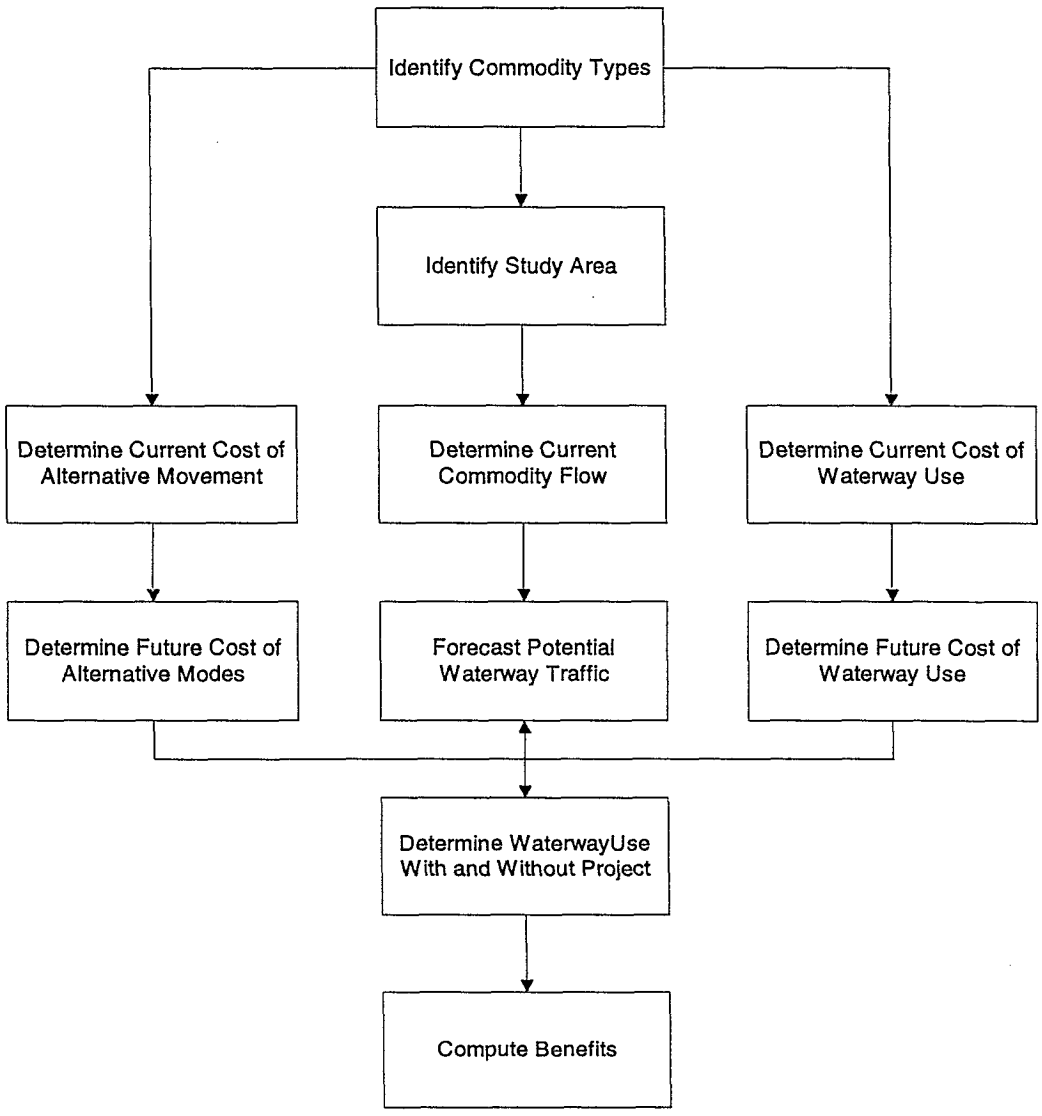
Figure 11A: Benefit/Cost Analysis Framework: Navigation/Transportation Values

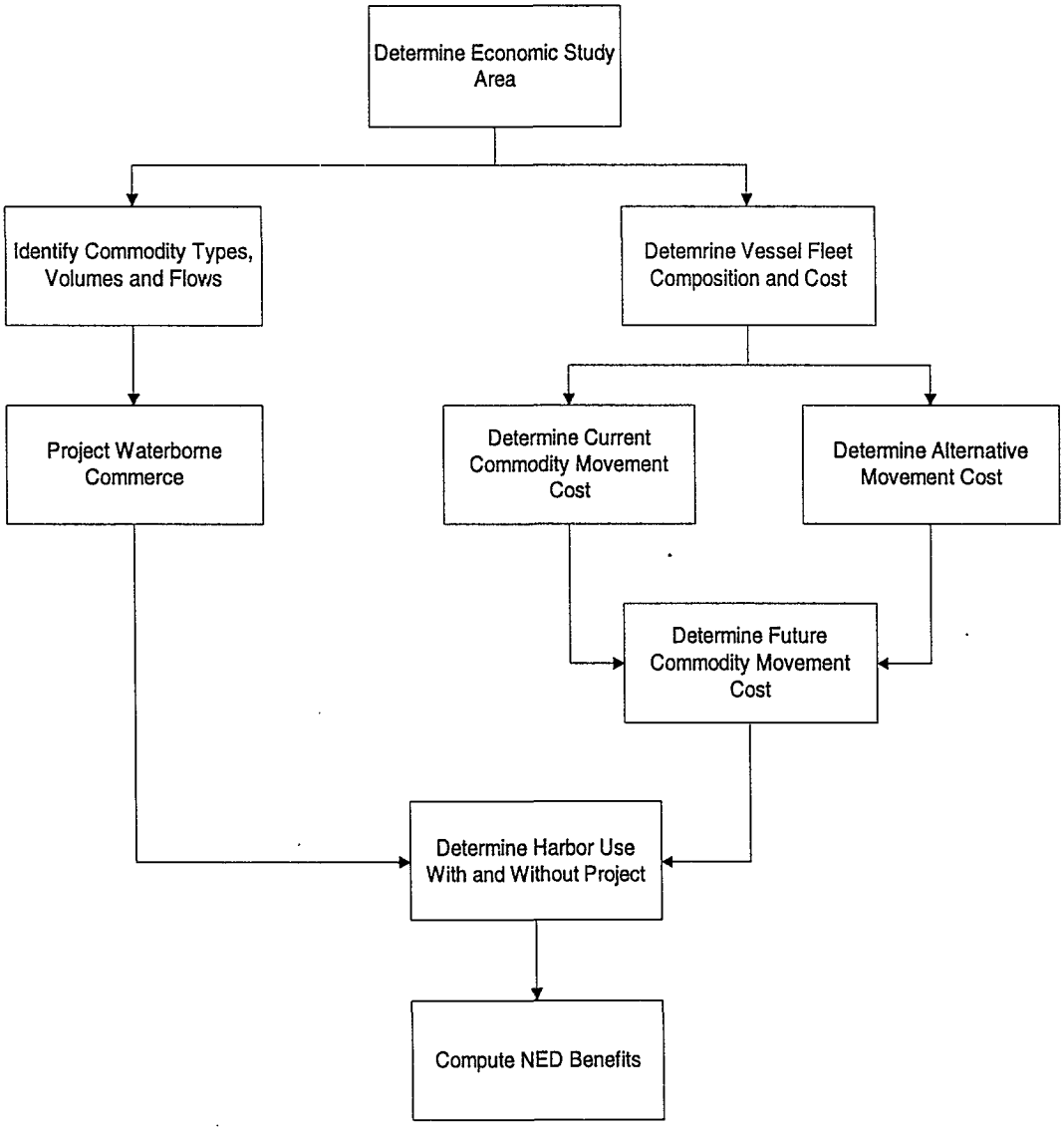
Inland Navigation



Source: Principles and Guidelines (3/83)

Figure 11B: Benefit/Cost Analysis Framework: Navigation/Transportation Values

Deep Draft Navigation



Source: Principles and Guidelines (3/83)

Figure 12: Plan Implementation: Political Process

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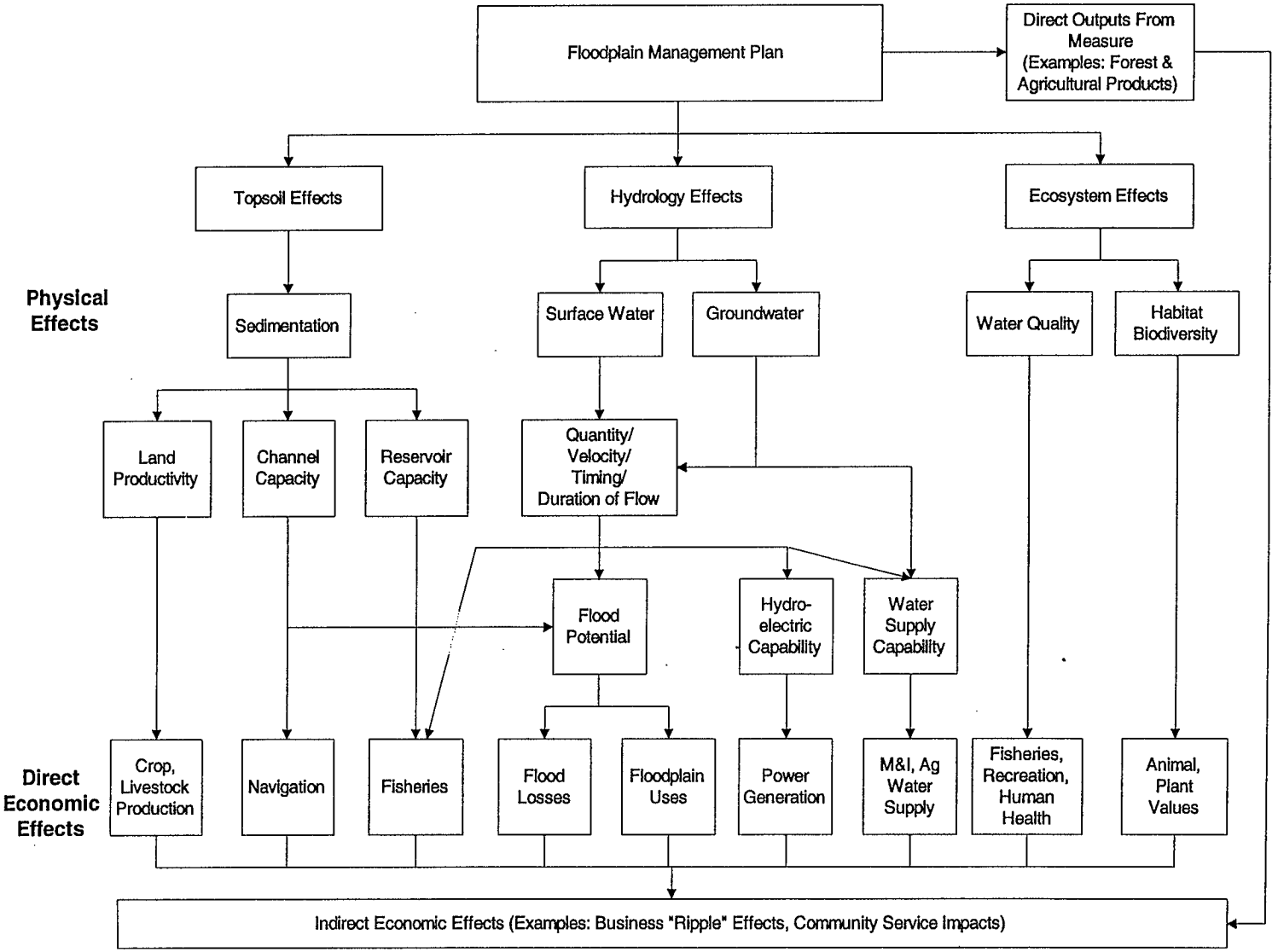
Figure 13: Example Floodplain Management Economic Analysis Framework *



* Modified from FAO Conservation Guide "Guidelines for Economic Appraisal of Watershed Management Projects"

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